

What Is Claimed Is:

1. A conformable surfacing veil comprising:
a plurality of structural fibers; and
a plurality of bicomponent fibers coupled to
said plurality of structural fibers, each of said
5 plurality of bicomponent fibers having a core
substantially surrounded by an outer polymer annulus,
wherein the melting point of said outer polymer annulus
is significantly lower than said core and said
plurality of structural fibers.

10 2. The conformable surfacing veil of claim
1, wherein a portion of said plurality of structural
fibers comprises one or more irregularly shaped fibers,
said one or more irregularly shaped fibers having a
melting point significantly higher than said outer
15 polymer annulus.

3. The conformable surfacing veil of claim
2, wherein said plurality of irregularly shaped fibers
have a linear density of between about 1.5 and 15
denier.

20 4. The conformable surfacing veil of claim
2, wherein said one or more irregularly shaped fibers
comprises one or more crimped fibers.

25 5. The conformable surfacing veil of claim
2, wherein said one or more irregularly shaped fibers
comprises one or more crimped polyester fibers.

6. The conformable surfacing veil of claim
2, wherein said one or more irregularly shaped fibers
comprises one or more crimped nylon fibers.

7. The conformable surfacing veil of claim 2, wherein said one or more irregularly shaped fibers comprises one or more randomly coiled or spiral fibers.

8. The conformable surfacing veil of claim 5 1 further comprising a plurality of microspheres, said plurality of microspheres comprising between about 5 and 20 weight percent of the conformable surfacing veil.

9. The conformable surfacing veil of claim 10 1, wherein said plurality of structural fibers comprises a plurality of glass fibers, said glass fibers selected from the group consisting of E-type glass filaments, S-type glass filaments, alkaline resistant glass filaments, C-glass filaments, ECR-type 15 glass filaments, wet use chop strands, and combinations thereof.

10. The conformable surfacing veil of claim 9, wherein said plurality of glass fibers have a diameter between approximately 6 and 25 microns and a 20 length of between about 0.125 inches and 3 inches.

11. The conformable surfacing veil of claim 1, wherein said plurality of structural fibers comprises a plurality of polyester fibers.

12. The conformable surfacing veil of claim 25 11, wherein said plurality of polyester fibers have a linear density of between approximately 0.5 and 15 denier and a length of between about 0.125 inches and 3 inches.

13. The conformable surfacing veil of claim 11, wherein said plurality of polyester fibers is selected from the group consisting of straight filaments of polyethylene terephthalate fibers, round 5 filaments of polyethylene terephthalate fibers, and cut staple filaments of polyethylene terephthalate fibers.

14. The conformable surfacing veil of claim 1, wherein said plurality of structural fibers comprise between approximately 25 and 95 percent of the total 10 weight of the conformable surfacing veil.

15. The conformable surfacing veil of claim 1, wherein said core comprises polyethylene terephthalate.

16. The conformable surfacing veil of claim 15 1, wherein said core comprises approximately 60 weight percent of said bicomponent fiber.

17. The conformable surfacing veil of claim 1, wherein said outer polymer annulus comprises a low melt copolymer polyester.

20 18. The conformable surfacing veil of claim 1, wherein said outer polymer annulus comprises a low melt copolymer polyethylene.

19. The conformable surfacing veil of claim 1, wherein said outer polymer annulus comprises a low 25 melt copolymer polypropylene.

20. The conformable surfacing veil of claim 1, wherein the melting point of said outer polymer annulus is at least 100 degrees Fahrenheit lower than

the melting point of said core and said plurality of structural fibers.

21. The conformable surfacing veil of claim 5 1, wherein said plurality of structural fibers comprises a plurality of glass fibers, said glass fibers selected from the group consisting of E-type glass filaments, S-type glass filaments, alkaline resistant glass filaments, C-glass filaments, ECR-type 10 glass filaments, wet use chop strands, and combinations thereof; and

wherein said outer polymer annulus comprises a low melt copolymer polyester.

22. The conformable surfacing veil of claim 15 1, wherein said plurality of structural fibers comprises a plurality of glass fibers, said glass fibers selected from the group consisting of E-type glass filaments, S-type glass filaments, alkaline resistant glass filaments, C-glass filaments, ECR-type 20 glass filaments, wet use chop strands, and combinations thereof; and

wherein said outer polymer annulus comprises a low melt copolymer polyethylene.

23. The conformable surfacing veil of claim 25 1, wherein said plurality of structural fibers comprises a plurality of glass fibers, said glass fibers selected from the group consisting of E-type glass filaments, S-type glass filaments, alkaline resistant glass filaments, C-glass filaments, ECR-type 30 glass filaments, wet use chop strands, and combinations thereof; and

wherein said outer polymer annulus comprises a low melt copolymer polypropylene.

24. A reinforced plastic article having a conformable surfacing veil as in claim 1.

5 25. The reinforced plastic article of claim 24, wherein the reinforced plastic article has a compound curvature within a portion containing said conformable surfacing veil.

10 26. A method for forming a conformable surfacing veil using a wet laid process comprising:

introducing a plurality of structural fibers and a plurality of bicomponent fibers to a whitewater chemical dispersion to form a whitewater slurry, said plurality of structural fibers comprising between about 15 25 and 95 weight percent of the total weight of said plurality of structural fibers and said plurality of bicomponent fibers, each of said plurality of bicomponent fibers having a core substantially surrounded by an outer polymer annulus, wherein the 20 melting point of said outer polymer annulus is significantly lower than said core and said plurality of structural fibers;

forming a filament network from said whitewater slurry;

25 introducing said filament network to an oven at a first temperature to melt said outer polymer annulus, said first temperature being less than the melting point of said core and said plurality of structural fibers;

30 removing said filament network from said oven, wherein said outer polymer annulus cools and adheres said bicomponent fibers to said plurality of structural fibers.

27. The method of claim 26, wherein forming a filament network from said whitewater slurry comprises:

5 reducing the viscosity of said whitewater slurry by introducing a whitewater stream to said whitewater slurry to form a lower consistency slurry;

10 introducing said lower consistency slurry to a former, said former functioning to align and distribute said plurality of structural fibers and said plurality of bicomponent fibers onto a moving woven fabric to form a random filament network; and

partially drying said random filament network over a suction box.

15 28. The method of claim 26, wherein the ratio of said whitewater slurry to said whitewater stream in said lower consistency slurry is between approximately 1:10 and about 1:40 by weight.

20 29. The method of claim 26, wherein said first temperature is between approximately 150 and 200 degrees Celsius.

30. A method for forming a conformable surfacing veil using a dry-laid process comprising:

25 introducing one or more plied card webs to a spiked roller to separate said plied card webs into a plurality of structural fibers and a plurality of bicomponent fibers, each of said plurality of bicomponent fibers having a core substantially surrounded by an outer polymer annulus, wherein the melting point of said outer polymer annulus is 30 significantly lower than said core and said plurality of structural fibers;

introducing said plurality of structural fibers and said plurality of bicomponent fibers into an airstream created by a ventilator;

5 delivering said plurality of structural fibers and said plurality of bicomponent fibers to a conveyor having a perforated cylinder, wherein said perforated cylinder lays down said plurality of structural fiber and said plurality of bicomponent fibers onto said conveyor to form a random filament 10 network;

introducing said filament network to an oven at a first temperature to melt said outer polymer annulus, said first temperature being less than the melting point of said core and said plurality of 15 structural fibers;

removing said filament network from said oven, wherein said outer polymer annulus cools and adheres said bicomponent fibers to said plurality of structural fibers.

20 31. The method of claim 30, wherein said first temperature is between approximately 150 and 200 degrees Celsius.

32. A method of forming a reinforcement material for plastic articles, the method comprising:

25 providing a reinforcing fabric;
forming a conformable surfacing veil, said conformable surfacing veil comprising a plurality of structural fibers coupled to a plurality of bicomponent fibers, each of said plurality of bicomponent fibers 30 having a core substantially surrounded by an outer polymer annulus, wherein the melting point of said outer polymer annulus is significantly lower than said core and said plurality of structural fibers;

laying said conformable surfacing veil onto said reinforcing fabric;

applying light heat and pressure sufficient to remelt said outer polymer annulus; and

5 cooling said outer polymer annulus such that said outer polymer annulus couples together said reinforcing fabric to said conformable surfacing veil.

33. The method of claim 32, wherein forming a conformable surfacing veil comprises forming said 10 conformable surfacing veil using a wet-laid process.

34. The method of claim 33, wherein forming said conforming surfacing veil using a wet-laid process comprises:

introducing a plurality of structural fibers 15 and a plurality of bicomponent fibers to a whitewater chemical dispersion to form a whitewater slurry, said plurality of structural fibers comprising between about 25 and 95 weight percent of the total weight of said plurality of structural fibers and said plurality of 20 bicomponent fibers, each of said plurality of bicomponent fibers having a core substantially surrounded by an outer polymer annulus, wherein the melting point of said outer polymer annulus is significantly lower than said core and said plurality 25 of structural fibers;

forming a filament network from said whitewater slurry;

introducing said filament network to an oven 30 at a first temperature to melt said outer polymer annulus, said first temperature being less than the melting point of said core and said plurality of structural fibers;

removing said filament network from said oven, wherein said outer polymer annulus cools and adheres said bicomponent fibers to said plurality of structural fibers.

5 35. The method of claim 32, wherein forming a conformable surfacing veil comprises forming said conformable surfacing veil using a dry-laid process.

10 36. The method of claim 35, wherein forming said conforming surfacing veil using a dry-laid process comprises:

15 introducing one or more plied card webs to a spiked roller to separate said plied card webs into a plurality of structural fibers and a plurality of bicomponent fibers, each of said plurality of bicomponent fibers having a core substantially surrounded by an outer polymer annulus, wherein the melting point of said outer polymer annulus is significantly lower than said core and said plurality of structural fibers;

20 introducing said plurality of structural fibers and said plurality of bicomponent fibers into an airstream created by a ventilator;

25 delivering said plurality of structural fibers and said plurality of bicomponent fibers to a conveyor having a perforated cylinder, wherein said perforated cylinder lays down said plurality of structural fiber and said plurality of bicomponent fibers onto said conveyor to form a random filament network;

30 introducing said filament network to an oven at a first temperature to melt said outer polymer annulus, said first temperature being less than the

melting point of said core and said plurality of structural fibers;

removing said filament network from said oven, wherein said outer polymer annulus cools and
5 adheres said bicomponent fibers to said plurality of structural fibers.